Remarks:

Applicant has read and considered the Office Action dated August 22, 2007 and the references cited therein. Claims 1-17 are currently pending. Reconsideration and reexamination are hereby requested.

In the Office Action, claims 1-6 and 15-17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Chen et al. in view of Zeng et al. Applicant respectfully traverses the rejection.

SUMMARY OF CITED PATENTS AND OF THE PRESENT INVENTION

U.S. PATENT NO. 5,921, 244 TO CHEN STATES:

A magnet is used to **transport/deliver** a medical substance via a magnetic fluid to a treatment site. The magnetic fluid is **not** a photoactive medicinal drug.

U.S. PATENT NO. 6,128,525 to ZENG STATES:

A method for controlled dosimetry of photodynamic therapy by monitoring optical feedback signals simultaneously with treatment for increased treatment efficacy.

THE PRESENT PATENT APPLICATION STATES:

A method for affecting photodynamic processes of photoactive drugs which are **photochemically perturbed by a magnetic field**. The magnet field is **not** used for actuation, **not** for carrying, and **not** for transport of any drugs. Long's magnetic field is intended to induce

a **quantum mechanical effect** (see Fig 3) on the photodynamic processes and photochemistry of the drug itself (i.e., a magnetic modification of photoexcited electron spins).

Support of Long's magnetic induction of **photochemical** changes can be found at least at:

1) Abstract & claim 1: "elucidate **reaction dynamics** of photoactive compounds **affected by** an external magnetic field"

2) Invention title: "...optical signals **affected by** an external magnetic field"

3) Background paragraph beginning on page 3, line 22:

" ....the effect of magnetic fields on chemical kinetics...and the **potential energy surfaces of reactions** may be affected by an external magnetic field"

"...these reactions include reaction steps 14 and 17 (Fig. 2, **a photochemical reaction mechanism of the photodynamic pathway)**".

" In the present invention, the use of **magnetic fields** is employed to **affect the rate of triplet-triplet annihilation reactions**, and for **modifying the spin state populations** of charged and uncharged radical pairs."

4) Figure 3, a visual representation of the magnet induced Zeeman effect on a singlet and degenerate triplet state (photochemical species")

5) Paragraph beginning on page 5, line 11: Type 1 **reaction pathway** of an excited PS involves the **production of radicals**, their rates of formation and destruction can be **perturbed by applying an external magnetic field"**

6) Paragraph beginning on page 6, line 15: "When the **magnetic field is applied, the electronic Zeeman** splitting of the T states removes the degeneracy, the rate of **intersystem crossing due to hyperfine coupling mechanism** is reduced"

7) Paragraph beginning on page 7, line 6: "However, when a **magnetic field is applied,** the rate of certain reactions... **will perturb the observed decay rate.** Because electronic transitions are quantum mechanically allowed...

8) Paragraph beginning on page 7, line 17: "The B1/2 value is determined as the magnetic field strength at which the **magnetic field effects** reaches half saturation. As B1/2 **depends on the concentration of the radical species, it will change with the photosensitizer (PS) uptake and concentration"**

All photoproducts analyzed in Long's invention for the purposes of dosimetry are **biproducts of the magnetic photochemical perturbation**, and thus entirely different analyts and provide different information from the standard photodynamic products produced in the absence of a magnetic field (as in Zeng's invention).

FUTHER CLARIFICATION OF THE DIFFERENCES BETWEEN THE PRESENT INVENTION AND THE CITED ART

The use and purpose of the magnet by Chen et. al. for photodynamic therapy is conceptually completely different from the present invention. As stated repetitively in the abstract, the intention and sole purpose of the magnet is for **transport of a medicine to its target site**. Unlike the magnet in Long, the magnet in Chen et al. serves as a delivery tool, and

their magnetic fluid does NOT participate in the photochemistry comprising the PDT treatment process. This is evidenced in Chen's abstract that states: "A magnet used for concentrating a medical substance *carried* by a magnetic fluid", "the magnet (or magnets) can be disposed inside the PDT probe, which then *carries* the magnet(s) to the internal site. Furthermore, the photosensitizing drug in the present application is also the magnet-sensitive agent. The scope of the present application is entirely different than that of Chen's patent, in that the **magnetic field is used to induce photochemical changes in the PDT mechanism**. The entire basis for instant claims 1-7 relies on the basis of using a magnet to perturb magnetic spin perturbation of photoexcited electrons of the drug. Briefly, the magnet induces photochemical effects based on hyperfine interaction in a *weak* magnetic field in the present application. The present application does NOT claim, nor intend to claim that the magnetic is used to physically actuate, transport or move medicine as with Chen. Chen's magnetic carrier is NOT the medicine participating in the photodynamic process (i.e. the magnetic fluid is independent of the medicine for treatment). Because Chen's magnet does NOT affect photochemistry, he uses "magnet having a high field strength" whereas the present invention is based on using weak fields to select the type of **photochemical perturbation** (i.e. hyperfine vs. Zeeman effects).

Thus, it is respectfully submitted that the grounds for rejection based on Chen's use of a magnet is not appropriate. Chen's invention is clearly different. Thus, the rejection of the claims over Chen in view of Zeng also cannot stand since a person skilled in the art would not look to Chen et al. as a primary reference, and Zeng cannot overcome Chen's deficiencies.

In addition, Zeng's patent indicates one possible method for controlling dosimetry in PDT. Zeng suggests this can be achieved most effectively and safely by optical monitoring some photoproduct simultaneously while treating, an obvious and global goal of all photodynamic treatment methods. The involvement of oxygen is obvious and necessary in any photodynamic monitoring and treatment. This is in fact, the basis of photodynamic therapy. There is a fundamental difference in the role of oxygen, however in the present invention. Specifically, the

existence of the magnetic action on the photochemistry relies entirely on a specific photodynamic pathway, as controlled by oxygen concentration. In other words, the magneto photochemistry is mediated selectively and specifically through a particular mechanistic pathway, Type 1 photosensitization, dictated by the level of oxygenation. Therefore, naturally it makes sense that the magnet field induced effects of the present application may be used as a metric for probing the oxygen status operating under a selective mechanism dictated by the B field.

Claims 7-14 were allowed. Applicant thanks the Examiner for the allowance of these claims.

It is respectfully submitted that that the present amendment places the application in condition for allowance and a notice to that effect is earnestly solicited.

Respectfully submitted,

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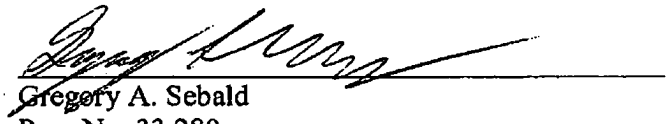

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